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AIR AND SPACE POWER—
SECURING THE FOUNDATIONS

A Research Paper

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Preface

This paper began when I had the opportunity to be the executive officer to the commander of Air Intelligence Agency—an organization undergoing significant transformations as the Air Force grappled with downsizing, new threats, new opportunities such as Information Warfare, and self-examination for relevancy in the Joint Fight. Intelligence, my own profession, seemed to be leveraging Information Warfare as its cornerstone among the other Air Force issues.

As I listened and occasionally participated in discussions between senior officers, civilians, and fellow mid-career professionals, I found (as many have) that there is no lack of brainstorming on what potentially can be done, but there is a black hole in determining relevance, functions, and organizations appropriate to supporting US information warfare. I traced the problem (parochially) to AF doctrinal confusion—how do we use IW if we don't properly define what we do overall? This paper is intended as the first of a three part answer to this question. By researching the role of Air and Space Power in military doctrine, I intend to lay the groundwork for AF Information Doctrine.

I offer heartfelt thanks to my faculty advisor, Mr. Budd Jones of the Air Command and Staff College, and the many friends and colleagues who have shared a beer over these ideas. None of my efforts would be possible without the love and support of my wife, Trish, my daughters and son, and the blessings of God.

Abstract

Doctrine describes and prescribes how we intend to develop, organize, train and employ our military force to accomplish objectives. This paper proposes that air and space power is misunderstood by civilian and military leaders because our shared understanding of the nature of warfare and the purposes of military power is essentially unchanged from Napoleonic concepts of warfare. In turn, air and space power doctrine—an expression of how the mediums can be used to achieve military objectives—is stuck in this outdated paradigm.

Through the use of an analytic framework for doctrine that contrasts its characteristics with underlying assumptions, a sequence of flaws in fundamental (basic) and environmental (medium-based) doctrine is revealed and examined. Relying on a wide range of critics and practitioners as source material, the author highlights not only the common threads of argument, but also some shared conceptions of how the flaws might be corrected. Two steps are recommended to secure the foundation: first, recognize the change in the nature of war; and second, develop an air and space doctrine which links the flexibility of their power to the military purposes inherent in modern warfare.

Military forces provide a nation's ability to **compel**, **coerce** and **deter** adversaries, and **reassure** and sustain allies. This new foundation reveals the remarkable breadth of application for air and space power, and is shown to have a strong relationship to joint doctrine, the national security strategy, and joint and Air Force strategic visions.

Chapter 1

The 'Why' of Doctrine

I received an extraordinary message stating that once we were committed to the landing, we would continue with the operation until we had suffered 82.3 percent casualties. I thought, 'God, what kind of idiot would write an order putting in a decimal point like that?'

—Lieutenant Colonel Robert Taplett, USMC
as quoted in *The Korean War*

Somewhere in the field of jokes and anecdotes about the differences between the Air Force and its sister services there ought to be a tombstone marked “AFM 1-1, March 1992.” The reaction of the average airman—that their current doctrine was handy as a doorstop or ballast for the bookshelf—differs remarkably from the serious historian or fellow soldier and Marine, who are familiar with the content and even passionate about the meaning of doctrine. Even the most casual review of writings about air and space doctrine shows a plethora of criticism for what the Air Force officially thinks about its role in military operations.

Doctrine describes and prescribes how we intend to develop, organize, train and employ our military force to accomplish objectives. If the doctrine that exists produces reactions much like Lt Col Taplett's to his orders for the Inchon landing, then it is more likely we will turn to opinions, tradition, and the strongest personalities of the moment. If we are lucky, the resulting military forces will still win wars and accomplish objectives,

despite the lack of a shared understanding of what those forces have as their mission and guiding principles. Unfortunately, history is full of examples to the contrary, where the cost in lives was high and failure frequent.

Critics abound with valid concerns about air and space power doctrine, and there would be little challenge in adding to the shelves a research paper addressing their existence. This paper rather proposes that Air and Space power is misunderstood by civilian and military leaders because of critical flaws in basic military doctrine. Fundamental doctrine—our shared understanding of the nature of warfare and the purposes of military power—is essentially unchanged from Napoleonic concepts of warfare. In turn, air and space power doctrine—an expression of how the mediums can be used to achieve military objectives—is stuck in this outdated paradigm.

The following pages will present an analytic framework for doctrine, examine the sequence of flaws in air and space doctrine using the framework, and correspondingly recommend two steps to securing the foundation: first, recognize the change in the nature of war with a new, fundamental military doctrine; and second, develop an air and space doctrine which describes the flexibility their power offers in meeting the new, basic military purposes.

Chapter 2

Understanding Doctrine as a Blueprint

It is the task of military science in an age of peace to prevent the doctrines from being too badly wrong.

—Sir Michael Howard

Just what is doctrine and what does it do for us? Joint Publication 1 begins its brief description of the role of doctrine with a series of quotes, then states, “Military leaders understand the nature and utility of doctrine.”¹ This supposedly innate knowledge seems to belie the controversies in air and space doctrine; but perhaps the flaws sparking these controversies are in the substance and not the nature of doctrine. To understand whether basic or air and space power doctrines are flawed, we must define what doctrine is and describe its dimensions. By identifying its characteristics and considering the assumptions, we can develop a framework for evaluating the nature of warfare and today’s air power critiques...and determining whether the Air Force is too badly wrong.

Doctrine Defined

Is there a particular way to perform a task, that can be repeated to achieve success? I.B. Holley says as much when he defines doctrine as “...the one best way to do the job which has been hammered out by trial and error, officially recognized as such, and then taught as the best way to achieve optimum results.”² Dennis Drew reviewed a number of

definitions, and offered that “Military doctrine is what is officially believed and taught about the best way to conduct military affairs.”³ Finally, Joint Pub 1 adds that “Military doctrine presents fundamental principles that guide the employment of forces...[and] provides distilled insights and wisdom gained from our collective experience with warfare.”⁴

Doctrine thus has specific characteristics: it describes a *method* of doing something; it possesses some *legitimacy* based on generally successful experience and official recognition, and it is *taught* to others. Two of these characteristics—a *method* that is *taught*—imply a practical nature to doctrine; yet doctrine is also more than just an opinion or assertion. The third characteristic of *legitimacy* seems to be that which makes doctrine different in kind.

Drew and Holley believe that doctrine’s official recognition is synonymous with being the ‘best’ means to the end. The process goes like this:

Numerous recorded instances have led to a generalization...In World War I, as more and more pilots tried attacking from above, astern, and out of the sun, they found the probability of making a kill tended to rise rapidly. On the basis of such experiences, reinforced by repetition, those who instructed neophyte pilots generalized this common pattern of attack into informal doctrine. Eventually, this informal doctrine appeared in manuals bearing the official imprimatur as formal doctrine.⁵

Doctrine’s legitimacy stems from its recognition: first, there must be some amount of experience in use to qualify a method as doctrine proper; second, that experience is generally regarded as supporting the method—in other words, it was successful—or we wouldn’t want to teach it to encourage (guide) or demand (authoritatively prescribe) its use.

By the very terms we are using, then, “Air Power doctrine” should be an officially recognized generalization of what our experience shows is the best means for employing ‘air power’, which we teach to others. But to what ends are we employing this general method or means?

Dimensions of Doctrine

Within the context of air power, a doctrinal statement could capture anything from the counter to a head on, 1-V-1 fighter engagement, to the primary task of an Air Force in a continental war between industrial powers. The wide breadth of area that could be covered implies that there are other dimensions to doctrine. Dennis Drew proposes three levels of doctrine as Fundamental, Environmental, and Organizational. Fundamental doctrine is broad and generally consists of beliefs about the purposes of the military and nature of war. Environmental doctrine compiles beliefs about employing military forces in particular mediums such as land, water and air. Lastly, organizational doctrine rolls in current capabilities and values by establishing how a particular organization accomplishes its tasks.⁶

This aspect of doctrine is essential: it describes, even if by inference alone, a relationship between the means proffered and the ends sought. Frankly, it doesn’t make sense on the face of it to talk about the best method for doing *something* unless we know or share the same assumptions of what the *something* is supposed to accomplish. Drew’s Fundamental, Environmental and Organizational levels of doctrine are not independent categories; talking about the best methods of military force in the sea (environment) implies some aspects of what military force does (fundamental) and may address a specific

service dedicated to the sea like the navy (organizational.) I.B. Holley is particularly incisive on this point when he says, “Before one sets about formulating doctrine, it is imperative that one’s frame of reference, one’s state of mind, is understood. It is dangerously easy to be unaware of one’s unstated assumptions.”⁷

A Framework for Doctrine

An analytic framework for examining doctrine can be drawn from Dennis Drew’s “Doctrine Tree.”⁸ The doctrine tree is a metaphor for the relationships between the *characteristics* of doctrine and its interdependent *levels*. The roots of the tree are the general experiences and history. The trunk is fundamental, the basis for all other doctrine, which is generally stable and unchanging. The branches represent environmental approaches, which can work in concert or separately to feed the trunk, yet are not necessarily as unchanging. Finally, the leaves are like organizational doctrine, outgrowths of the branches but dependent upon all else, and changing with the seasons.

We can translate this metaphor into a framework as in Figure 1.⁹

Doctrine	Method	Legitimacy	Teaching
Fundamental	What does the military do for the nation?	Military theory, history & doctrine	Theorists, historians and practitioners of war & military
Environmental	How can we use this medium to achieve military objectives?	Theory, history & doctrine involving this medium	Theorists, historians and practitioners of this medium
Organizational	How does this service branch contribute to military missions?	Law, history & development of service branch	Practitioners; Service roles & missions; Training; Doctrine publications

Figure 1. A Doctrine Framework

The purpose of this framework is to look at doctrine from interdependent viewpoints: how does something meet the characteristics (definition) of doctrine; and what ends are being addressed (along with underlying assumptions of other levels)? This allows us to question basic assumptions; consistency in meeting the definition does not necessarily translate to sufficiency. As Drew puts it, "...not [having] valid fundamental or environmental doctrine...is analogous to a diseased trunk or branch, which could kill the tree including the leaves (i.e., lead to defeat)."¹⁰ Any examination should therefore begin at the roots and trunk: what is fundamental military doctrine, and is it flawed?

Notes

¹¹Joint Pub 1, *Joint Warfare of the US Armed Forces* (Washington, DC, 1995), I-3.

²Holley, 5.

³Dennis M. Drew, "Of Trees and Leaves: A New View of Doctrine," *Air University Review* 33 (Jan 1982), 41.

⁴Joint Pub 1, I-3.

⁵Holley, 91. Dennis Drew describes a similar process in "Of Trees and Leaves," 41-42.

⁶Drew, 43-45.

⁷I.B. Holley, "The Doctrinal Process," *Military Review* 59 (April 1979), 8.

⁸Drew, 46.

⁹ This framework is the author's own conception of how to link characteristics to dimensions of doctrine.

¹⁰Drew, 40.

Chapter 3

The Changed Nature of Warfare

Billy Mitchell claims a basic connection to military purposes when he says, "The principle mission...of aviation...is the destruction of the hostile aviation, in the same way that the principal mission of the navy is the destruction of the hostile navy, or the principal mission of an army is destruction of the hostile army."¹ By assuming the same *means* as the other services, he asserts a root equivalence in what his own medium *achieves* (the *ends*.) AFM 1-1 furthers this basic assumption:

The organization of the American military is based on the concept of task specialization...the services are organized under three departments, generally along the lines of mediums of warfare: air, land and sea...each department is charged with the development and cultivation of specialized competence...[and] are also charged with the responsibility for defining the future requirements of war fighting and deterrence with respect to the associated mediums of warfare.²

Has the Air Force limited itself from the beginning? Is it trapped in the same view of warfare that its sister services possess? The paradigm is that military forces are specialized by medium with the shared purpose of deterring, fighting and defeating similar military forces. The implied purpose of military forces is the destruction of enemy military forces, and the nature of warfare can be described as war fighting and deterrence of enemy forces. These inferences constitute our fundamental doctrine, and is the first focus for examination.

Fundamental Critiques

The purpose of aerospace power is to deter attack against us and, if we are attacked, to destroy the enemy's means to wage war.

—General Curtis Lemay, Sept. 1959

At the fundamental level of doctrine—the trunk to the roots of the tree—we are exploring the purpose, or purposes, of aerospace and military power. Fundamental doctrine serves as the bedrock for environmental and organizational doctrine; it is the underlying assumptions about the ends or objectives of the methods we describe at those other levels.³ The first sentence in the March 1992 edition of AF Manual 1-1 states “An understanding of aerospace doctrine must begin with an understanding of the nature of war.”⁴ The remainder of the chapter, and much supplementary material in Volume 2, makes it clear that air and space power doctrine rests on the assumption that military power is used to deter or win wars. The manual also adds that “A significant domain of military activities exists below the level of war” to explain a “...range of peacetime responsibilities...” that air forces and other military forces are asked to perform.⁵ Thus, the fundamental doctrine that air and space doctrine rests on—our assumptions about what aerospace power does—is that power is used to achieve military objectives which are based on deterring and winning wars.

This fundamental doctrine is not a unique presumption by the Air Force. *Joint Vision 2010* states, “The primary task of the Armed Forces will remain to deter conflict—but, should deterrence fail, to fight and win our Nation’s wars. In addition, we should expect to participate in a broad range of deterrent, conflict prevention, and peacetime activities.”⁶ Though this document is a vision statement rather than doctrine, this purpose of armed

forces is clearly stated and is supported throughout the Joint Pub series of doctrine pamphlets. Corroborating this view, FM 100-5, the Army's basic doctrine manual, says "Doctrine is the statement of how America's Army, as part of a joint team, intends to conduct war and operations other than war."⁷ Additionally, nearly all service doctrines cite Clausewitzian views of the nature and purpose of war. The unanimity of the services on fundamental doctrine is remarkable.

All of this unanimity might justify saying that *military doctrine describes how military forces best are used to deter and win the nation's wars*. However, there are at least two major critiques to consider. First, as mentioned above, the services and the joint community notably divide the purpose of military force into two categories: deterring and winning the nation's wars, and military operations other than war. The 'other' category covers a wide and frequently used range of activities, with somewhat subjective separation from war by the scale of effort and the element of armed conflict,⁸ yet most service doctrine still focuses on and gives first priority to wartime responsibilities. Thus, air, space and other power doctrines may be insufficiently tied to all their basic purposes by not having a fundamental doctrine which clearly describes the relationship of 'other-than-war' activities to deterrence and fighting.

A second and related critique of fundamental doctrine is an oft-repeated dictum about airpower: that it fundamentally changed something. The current AF Chief of Staff recently charged that "airpower has fundamentally changed the nature of warfare [and]...joint and combined doctrine has not caught up with this development."⁹ In contrast, the current AFM 1-1 says that "air power...did not change the essential nature of

war, but air power did change the way war is conducted.”¹⁰ These conflicting statements are not trivial, nor are they isolated examples.

Both critiques are related to defining the ‘essential nature’ of war. Clausewitz, the grandmaster of war theory and a prime source for much of US doctrine on the nature of war, describes it thus:

Warfare comprises everything related to the fighting forces—everything to do with their creation, maintenance, and use. Creation and maintenance are obviously only means; their use constitutes the end...The whole of military activity must therefore relate directly or indirectly to the engagement...Since in the engagement everything is concentrated on the destruction of the enemy, or rather of *his armed forces*, which is inherent in its very concept, it follows that the destruction of the enemy’s forces is always the means by which the purpose of the engagement is achieved. The purpose in question may be the destruction of the enemy’s forces, but not necessarily so; it may be quite different.¹¹

The last sentences point out that the strategic or national purpose attained by the use of military forces may be the defeat or destruction of the armed forces—but it may also be something else entirely. Therefore, the Napoleonic view of the essential nature of war is that *the purpose of military forces is to engage and defeat enemy military forces as a means of attaining national objectives*.

Surprisingly little has changed on this view to date; the impact of naval theory or maritime strategy, and the prophets and proponents of airpower, have remained within the framework of this concept of military power:

In the 1920’s Giulio Douhet and other early theorists of ‘air power’ did for the airplane what Mahan in the 1890s had done for the warship; they developed a doctrine for its optimal strategic employment that closely resembled the Jominian version of Napoleonic warfare. Airplanes, like warships and armies, should be massed against the decisive point. That point was located not in the armed force of the enemy, but in his economic and administrative centers, which were so vulnerable to aerial attack. In this definition of ‘decisive point,’ strategic-bombing doctrine seems to

diverge from the older orthodoxies of Jomini and Alfred Thayer Mahan, who had stressed the army-to-army and fleet-to-fleet confrontation. *Closer examination, however, shows less divergence than there might seem.*¹²

What John Shy goes on to explain in the above passage is that, in attacking these decisive points that were not the armed force of the enemy, both naval and airpower primarily focused on the 'military economy', or sources of strength and sustainment to the enemy forces themselves. Therefore, naval and airpower did not change the nature of warfare, but its context—we now felt that we could defeat enemy armed forces either by face-to-face destruction, or removal of their supporting props.

Some theorists and thinkers remain within this framework even when pushing out into the new realms of information warfare. In one article, the writers state:

The mission of the Air Force is not merely what it does (tending to air and space operations) but what it contributes (determining how to operate for strategic effect). Knowing how to transport mass of energy to targets—plinking tanks or flattening cities—has its time and place. Yet, it is but a subset of knowing how to get and use knowledge to confound or terminate the production, distribution, and increasingly, control of all sources of opposing military strength.¹³

Another current thinker on doctrine, in an article encouraging the Air Force to more fully develop its concepts of airpower and influence joint doctrine, argues:

...The raw material of air doctrine is a blueprint for concepts of warfare *inherently different* from surface maneuver traditions. Basic principles of air doctrine describe and present a view of warfare from the vertical dimension...The airman's perspective and ability to see and operate across the battlespace made unified command of air assets crucial to full success...the improved lethality and effectiveness of air attacks hold out the potential to change the focus of warfare from twentieth-century surface maneuver to twenty-first-century air and space dominance.¹⁴ [Italics added]

But what is inherently different in this warfare? The argument seems to be that air power more *effectively* attacks enemy forces than ground or naval force—this is a change in context more than any change in the essential nature of war, which remains focused on

enemy force destruction. Reinforcing this kind of argument, Col. Mann in examining airpower in the Gulf War writes,

...If one is to exploit the speed, range, and flexibility of modern aerospace forces...[they] must not be tied directly to the ponderous movement of surface forces or to the vision of a surface commander...Rather, they must be controlled by someone who is looking beyond corps boundaries—all the way to Baghdad, so to speak. This is the sense in which airmen seek to be independent—not from national or theater objectives, commander's intent, or joint/combined operations, but from a surface commander whose vision is naturally and correctly focused on a corps-sized (or division- or brigade-sized, etc.) 'rectangle.'¹⁵

When analyzed, *most* allegations about the change wrought on warfare by airpower boil down to a change in the context of war rather than its essential nature—but not all. A counterpoint held by early theorists and some modern proponents is best summarized by this statement of Billy Mitchell to the House Committee on Military Affairs in February 1926:

There has never been anything that has come which has changed war the way the advent of air power has. The method of prosecuting a war in the old days always was to get at the vital centers of the country in order to paralyze the resistance. This meant the centers of production, the centers of population, the agricultural districts, the animal industry, communications—anything that tended to keep up war. Now, in order to keep the enemy out of that, armies were spread in front of those places and protected them by their flesh and blood...in the future, we will strike, in case of armed conflict, when all other means of settling disputes have failed, to go straight to the vital centers, the industrial centers, through the use of an air force and hit them. That is the modern theory of war.¹⁶

The change in nature described here is the possibility of making war *without engaging* enemy forces—settling disputes by striking solely at vital centers, whether or not they are directly related to the 'military economy,' if such centers can be found.

The difficulty with this viewpoint lies in the specific means suggested above—striking vital centers not necessarily related to enemy forces—as most airpower proponents

concede that morale bombing or striking at political will is generally discredited. It has not worked.¹⁷ But, regardless, the fundamental argument is that airpower may have changed the essential nature of war by offering a use of military power apart from direct engagement of enemy forces or their means of support. Does military power offer more than engaging enemy forces?

The current Chief of Staff of the Air Force argues that it does. The following is an oft-repeated theme in his writings and speeches:

We've got to start by helping people recognize that airpower has fundamentally changed the nature of warfare. Airpower's impact is felt throughout the entire spectrum of warfare. Airpower can be used to indicate concern, to threaten and to deter. It can construct a defense to confuse an adversary. It can deploy forces and give them mobility. It can support other forces, both operationally and tactically. And if needed, airpower can penetrate and strike unilaterally. In this manner, airpower has truly changed the essence of warfare.¹⁸

Doctrinally, the idea that military power means more than engaging enemy forces is relatively undeveloped. Almost unanimously, publications that address the use of military force and power beyond combat relegate these uses to "operations other than war," a second class distinction that consistently emphasizes it is not the military's primary purpose. If we accept the Clausewitzian definition of warfare as being the creation, maintenance and use of military forces, however, then there is dissension in the ranks.

Though we still have to be prepared for the worst-case scenario and operating across the full spectrum of conflict, the most likely scenarios we face are these operations other than war,' Brigadier General William Hodges, director of logistics for the US Air Forces in Europe (USAFE), which is responsible for the air component of Joint Endeavor, said in an interview. 'We just have to accept the fact that these types of operations are the nature of the beast we'll be dealing with on a day-to-day basis..¹⁹

Our review of fundamental doctrine and its critiques is shown in Figure 2.

Fundamental Doctrine	Military Power	Critiques
Method	The purpose of military forces is to engage and defeat enemy military forces as a means of attaining national objectives	<ul style="list-style-type: none"> —Air power changed the context...attacking support structures of forces possible —Air power changed the nature...can achieve objectives independent of ground action —Aerospace speed, range, flexibility extend war beyond battlefields
Legitimacy	Extant War Theory War Experience US Title 10	<ul style="list-style-type: none"> —Military Operations Other Than War (MOOTW) —Experience since end of Cold War
Teaching	Service Doctrines Joint Vision 2010	<ul style="list-style-type: none"> —Defined primary use of military is not same as most common use —New roles (e.g., Peacekeeping, Information Warfare) do not fit & are treated as secondary

Figure 2. Fundamental Doctrine Matrix

A New Concept for Military Doctrine

The next step in evaluating fundamental doctrine is to examine what Figure 2 summarizes for commonality or recurring observations. The first theme that repeats itself among the critiques regards an attack on the essential nature of war: does engagement of enemy forces capture all the modern uses of military forces? This theme says no; military forces are used for non-war roles which we label “MOOTW” more often than their ‘original’ purpose; and these MOOTW roles largely include activities where there is not even a defined adversary.

As we touched upon earlier, the fact that US doctrine separates military purposes into War and MOOTW is not in itself incomplete—together they comprise or describe all the activities of military forces. However, this particular categorization creates two problems: first, it arbitrarily designates “War” or large scale combat as the primary and overriding

purpose, despite historical evidence that the nation uses military force more often and more resolutely for “MOOTW”; second, in its implementation this war-centric fundamental doctrine has restricted development or confused the purpose of doctrine for non-war military tasks. We can summarize this flaw as:

Either the nature of warfare has changed, or the nation is using military force in inapplicable roles. Our doctrinal heritage is that use of military force constitutes warfare, and operations other than war now outnumber war operations. Yet US doctrine appears to abandon non-war roles or arbitrarily relegate them as ad hoc, lower priority tasks.

Why does fundamental doctrine separate the employment of military force into distinct classes of ‘war’ and ‘not-war’, or MOOTW? Many writers suggest it is directly related to the paradigm of warfare constituted as *engaging and defeating enemy forces for the attainment of national objectives*—a Napoleonic paradigm of warfare.

Complete with profound insights into the eternal mechanics and psychology of war, the teachings of Clausewitz remain unsurpassed...they pervade the professional discourse of US service academies and war colleges and can easily be recognized in current field manuals and official doctrinal statements. Many such documents are prefaced by restatements of the principles of “war” that are actually in large part the Clausewitzian principles of Napoleonic war.

Both were fully appropriate to the circumstances of the two world wars and also of the Cold War...Neither fits present circumstances, domestic or international. There are no threatening great powers on the current world scene, only a handful of quiescent rogue states, and many lesser wars and internal disorders that cannot arouse the nation, for none of them directly threatens the United States or its compelling interests.²⁰

What is needed to change this paradigm is a recognition that: a) decisive battle and defeat of enemy forces is no longer in consonance with US limited objectives (including minimized casualties, minimal commitment of forces, and concerns with time); and b) the US will use primarily use military force to influence others at the margin while minimizing risks. What this implies for our doctrinal ‘war’ and ‘not-war’ is that the categorization is

not only arbitrary but completely wrong in treating 'not-war' as any lesser a priority for national objectives than 'war.'

If we are to accept this critique, we must find a new statement or fundamental doctrine to describe the nature of war and the purpose of military forces. One way to define the nature of war is to focus on the uses of military forces. Classically, the use of the military has been for combat engagement with enemy forces. Changes are reflected in the words of military leaders and in military publications. Using a previous quote from Gen. Fogleman, a draft Army doctrine publication (FM 100-3), and Joint Pub 3-07 (Joint Doctrine for Military Operations Other Than War), we can piece together a new view of the nature of war and military purpose:²¹

Purposes of Military Forces	US Goals	Strategic Purposes	Air and Space Power "Roles"	The Tasks of Modern Warfare
War	Fight & Win	Compel	...can support other forces	Compel
	Wars		...can penetrate and strike unilaterally	Coerce
Military Operations Other Than War	Deter War & Resolve Conflict	Deter	...used to indicate concern, to threaten and to deter	Deter
Joint Pub 3-07	Promote Peace & Support US Civil Authorities	Reassure	...can deploy forces and give them mobility	Reassure
	MOOTW	FM 100-3 (draft) & Force XXI	CSAF Speech, Oct 95	proposed

Figure 3. Change in Warfare

Notes

¹ As quoted by Futrell, 33.

² AFM 1-1, par. 1-6, 3.

Notes

- ³ Drew, 43.
- ⁴ Air Force Manual 1-1, Volume 1, *Basic Aerospace Doctrine of the United States Air Force* (Washington, DC, March 1992), 1.
- ⁵ AFM 1-1, 3.
- ⁶ Joint Chiefs of Staff, *Joint Vision 2010* (Washington DC, 1995?), 2.
- ⁷ HQ TRADOC, Field Manual (FM) 100-5 (Washington DC, June 1993), 1-1.
- ⁸ Joint Pub 3-07, Joint Doctrine for Military Operations Other Than War (Washington DC, June 1995) I-1 to I-3.
- ⁹ Fogleman, 40.
- ¹⁰ AFM 1-1, 5.
- ¹¹ Carl von Clausewitz, *On War* Princeton translation (Princeton University Press, Princeton NJ, 1989), 95.
- ¹² John Shy, "Jomini," *Makers of Modern Strategy* (Princeton University Press, Princeton, NJ, 1986), 182.
- ¹³ Richard Szafranski and Martin C. Libicki, "...Or Go Down in Flame?: Toward an Airpower Manifesto for the Twenty-first Century," *Airpower Journal* (Fall 1996), 66.
- ¹⁴ Rebecca Grant, "Closing the Doctrine Gap," *Air Force Magazine* v80 n1 (Air Force Association, Arlington, VA, January 1997), 50.
- ¹⁵ Mann, 179.
- ¹⁶ As quoted by Futrell, 49. Liddell Hart and Douhet make very similar arguments.
- ¹⁷ This point is summarized throughout Chapter 9 by Pape in *Bombing to Win*.
- ¹⁸ Ronald R. Fogleman, "Air Force: The Future is Ours...Today," *Foundation Forum* (Aerospace Education Foundation, Arlington, VA, October 1995), 10.
- ¹⁹ James Kitfield, "Waging Peace," *National Journal* (5 Oct 1996).
- ²⁰ Edward N. Luttwak, "Toward Post-Heroic Warfare," *Foreign Affairs* v74 n3, May-June 1995, p114.
- ²¹ Joint Pub 3-07, Fig. I-1, p I-2; FM 100-3, *Strategic Purposes of Army Forces* (draft) (HQDA, April 1995), 1-3; Fogleman, "The Future is Ours," 21.

Chapter 4

Aerospace Warfare

The command of the sea is only a means to an end. It never has been, and never can be, the end itself...An admiral with no wider outlook than to regard the enemy's fleet as his primary objective will miss the true relation to the other forces which are working for a successful issue of the war.

—Sir Julian Corbett

Nearly a century ago, Corbett methodically attacked the prevailing winds of naval power doctrine with statements such as the above. He was one of the first theorists to recognize that military doctrine could not let itself stray too far from the ends it was intended to accomplish. But even more importantly, he began to question the relationship between what a service does in its medium of warfare and the ends of military power. How the military describes and prescribes the actions of its forces in a medium (air, space, land or sea) is what we call environmental doctrine.

Why is it worthwhile to categorize military actions into mediums? What is thought about the means and ends of air and space power? How can air and space power doctrine be unified under the new concept of fundamental doctrine? This chapter addresses these questions.

Why Mediums Matter

Your study outline refers to the Army, Navy and Air Force as though they were immutable. But to do justice to our subject we must question the reasoning behind the idea of a military service. Does a service find its justification—its reason for being—in exclusive ownership of certain weapons, or in exploitation of a particular strategy, or in the fulfillment of a strategic function, or by conducting operations in a certain medium?

—Evaluation Staff of Air War College, 1958

The focus so far has been to evaluate doctrine for in terms of fundamental flaws. It is worthwhile at this point to address the question, “Is our focus on medium itself a possible flaw in doctrine?” In other words, why are we looking for a separable method of warfare based on a certain medium? Is it solely due to our arbitrary scheme of organizing military forces into air, land, and sea Services?

Historically, before the rise of airpower early this century, most states that bordered the seas possessed two types of military forces. Armies and navies were easily separable, as their use was primarily against counterpart forces—there being little efficiency or ability for armies to attack navies, and vice versa. When air forces did come along, they were often built on the thought that they would likewise oppose counterpart forces. But:

...in other respects airpower upset and complicated the simple relationship between medium and role to the point that the nature of the entire problem was changed. Airpower opened up a medium through which, from the beginning, combat force could challenge operations in both the surface media, by hostile land and sea forces. And later it has become apparent that this air medium is one through which the vital resources of an enemy nation can be destroyed on a lethal scale without regard for military victory, as such, in any medium. In these respects it is clear that the addition of airpower was much more than the simple addition of a third dimension of warfare—a third kind of military function.¹

From this point of view, air power opened the proverbial can of worms, for now no military force could define its function without considering *another* medium—the air

dimension; navies and armies had to consider and integrate the effects of the air medium *within* their ways of war. Conversely, air forces had impetus to either leave their function-defining (read doctrine-making) to the other services, or find *independent definitions* of their function or method of war. If these independent definitions did not stay above the surface—say, air to air fighting like air superiority, or air to ground strikes against non-military targets like strategic bombing—they ran the risk of duplication or competition with the other services.

Some critics argue that this is exactly where the Air Force doctrine process broke stride. Strategic bombing with corollary air superiority formed the first independent purpose; and strategic bombing received mixed reviews after World War II. When nuclear weapons and ballistic missile systems entered our arsenal, the Air Force began describing itself and its purpose in terms of weapons systems.² Intellectual development of aerospace doctrine was haphazard at best, as the Air Force concentrated instead on *functions*. The incongruity can be described like this:

This is not to say that medium of operations is for this reason necessarily invalid as a criterion for justifying and delineating a military service or that it is inferior to the 'strategic task' or mission concept in this regard. It is to say, however, that the two concepts, far from being compatible and corollary, are in fact more nearly incompatible and should not both be simultaneously applied to the same component units of a military organization.³

The impulse to turn to weapons systems or functions seems irresistible—witness today's tunnel vision on precision and stealth technologies—because defining the weapons system purpose, and describing its connection to national objectives, is an easier problem in scale. But, we are left with the problem of how to use, distinguish, and prioritize *between* these weapons systems or functions. Furthermore, just as more than one service

gained nuclear weapons, we have no reason to believe that precision and stealth are the sole province of either the Air Force or aerospace forces⁴—yet these two ‘buzzwords’ are displayed throughout the current AF vision of *Global Engagement*.

While it is arguable that our focus on the medium is related to the Air Force as a service, a doctrine of air and space power can also serve as the basis for integrating weapons systems or functions, prioritizing their contributions to achieving national objectives, and rationalizing new technologies. There are far fewer mediums than military functions. Additionally, there are no a priori reasons to believe that categorizing military power by weapons systems rather than mediums offers any more logical a connection to fundamental doctrine. That the military compels, coerces, deters or reassures in the furtherance of national objectives is no more dependent on the specific weapon than it is the medium. Finally, functional doctrines offer no more separable a perspective than doctrine by mediums when we try to resolve service differences—the services overlap in functions as much as they do in mediums, if not more so.

Environmental Critiques

Environmental doctrine has several distinctive characteristics. First, it is clearly narrower in scope than fundamental doctrine because it deals with the exercise of military power in a particular medium. Second, environmental doctrine is significantly influenced by factors such as geography and technology.

—Dennis Drew, *Of Trees and Leaves*

The very terms *air* and *aerospace* in discussions of doctrine lead us to talking about military operations in that medium; thus, most air power doctrine can be considered as environmental doctrine at first blush. However, we can refine our thinking by keeping in

mind that environmental doctrine describes the use of all forces in that medium, rising above service orientations. In air power doctrine, that has not been an easy task, as even the earliest theorists expressed air power's uses in terms of dominant and independent air arms, decrying expenditures of resources on naval or army 'auxiliary' air forces.⁵ In keeping with our original framework, aerospace environmental doctrine should express how to use the medium(s) to accomplish military objectives.

From this perspective, there are really only two well-developed schools of thought for air and space power. The first is that they aid the ground forces "...to gain decisive success, with some recognition of the need for special missions at a great distance from the ground forces."⁶ Today this would most often be identified as close air support to ground and naval forces with a subordinate mission of long range interdiction. The second school is that air and space power's purpose is to "pass over all formerly visualized barriers or lines of defense...deliver devastating blows...even before surface forces can be deployed."⁷ This is the doctrine of strategic bombing: an indirect attack at the enemy that can achieve national objectives independent of other mediums. Both schools depend on achieving air (and space) superiority; but only the strategic bombing doctrine directly supports an independent air force or service, because it requires coordinated action independent of other operations.

There is little arguing that the US Air Force owes its existence to the support of those who believed in the strategic bombing doctrine of air power; unfortunately, few can also argue that there is no controversy over the success of this method of warfare. In fact, many readers may be dismayed at the portrayal of *air power enabling ground and naval*

actions to achieve objectives (the first school of thought) as still a 'valid' environmental doctrine. Consider the following statements, however:

An air force acting independently cannot win a war against a civilized nation, nor by itself, accomplish a decision against forces on the ground.' On the other hand, military forces could not be efficiently trained nor could they operate effectively without air force support. With respect to an army, an air force was an essential combat branch, and it had to be an integral part of an army command 'not only during battle but also during its entire period of its doctrinal training.'⁸

...Gen. Colin Powell, the chairman of the Joint Chiefs of Staff, has made a number of unusually public pronouncements...arguing most recently in *Foreign Affairs* magazine that force should not be used to send signals but only to reach a clear and attainable objective. Powell was scornful in his denunciation of 'so-called experts' who suggest 'a little surgical bombing or a limited attack,' which he called a recipe for escalation.'⁹

...[Gen.] John Shalikashvili had also expressed doubts that air power could achieve decisive results. 'There is no military solution,' Shalikashvili said just days before NATO issued its February 1994 ultimatum threatening air strikes in retaliation for any further Serbian aggression. 'The only way the conflict will stop is if the three parties want to stop it and agree to a truce.'¹⁰

'While the circumstances of warfare have changed considerably in terms of weapons system advances and capabilities...the essential nature of warfare has not changed,' said Army Chief of Staff Gordon Sullivan in May 1993. 'Units are still required to close with the enemy to get within direct fire range, engage the enemy, and either destroy him or force him to move off of contested terrain. War takes place where people live and people live on the ground. It is there that all the effects of our great military establishment are directed, to seize and control territory and make the enemy amenable to our will.'¹¹

While the last three statements are obviously recent, the first is quoted from the findings of a Congressional Board appointed in 1919 to make recommendations on the future of air warfare for US military and civilian operations. The proposition logically raised here is that air and space power is an advanced adjunct to battles being fought on ground (and in water) to achieve military objectives; environmentally, air forces are an

expansion of warfare into a third dimension but remain intrinsically tied to supporting the basic military objective of defeating the enemy's ground forces. The thought that *Air and space power expands the context of war but does not change its nature* is still considered by senior leaders to be historically valid.

The competing environmental doctrine arises from the argument that *air power has added something new to war: the opportunity for a nation to achieve its objectives by striking decisively at critical targets at a distance from enemy (ground) forces*. "Air power changed things by compressing the line between the strategic and tactical levels...To a great extent airplanes obviate the need to confront terrain or the environment because of their ability to fly over armies, fleets and geographic obstacles and strike directly at a country's key centers."¹² This school of thought is also historically consistent:

The principal mission of Aeronautics is to destroy the aeronautical force of the enemy, and, after this, to attack his formations, both tactical and strategical, on the ground or on the water. The secondary employment of Aeronautics pertains to their use as an auxiliary to troops on the ground for enhancing their effect against the hostile troops...[Bombardment aviation was] organized for the purpose of attacking enemy concentration points of all sorts at a distance from their front lines. Probably its greatest value is in hitting an enemy's great nerve centers at the very beginning of the war so as to paralyze them to the greatest extent possible.¹³

[The] air has introduced a third dimension into warfare...Aircraft enables us to jump over the army which shields the enemy government, industry, and people, and so strike direct and immediately at the seat of the opposing will and policy. A nation's nerve system, no longer covered by the flesh of its troops, is now laid bare to attack...¹⁴

The importance of strategic attack[:]...Countries are inverted pyramids that rest precariously on their strategic innards—their leadership, communications, key production, infrastructure, and population. If a country is paralyzed strategically, it is defeated and cannot sustain its fielded forces though they be fully intact.¹⁵

As environmental doctrine, strategic bombing does not argue that support of ground forces is an invalid use of air power; depending on the proponent, views on that use range from considering it inefficient to a secondary role of air forces to a parallel effort.

Since both schools recognize that air power can enhance combat effectiveness of ground and naval wars, it is not surprising that very little criticism is directly leveled at air power as an enabler or adjunct. Rather, most environmental critiques focus on air power as strategic bombing. And since strategic bombing has relatively few historical precedents or equivalents, it is this doctrine's *legitimacy* that is most often called to task—though some critics also find fault in the very *method*.

Robert Pape is one of those who finds fault with both legitimacy and method. In his book, *Bombing to Win: Air Power and Coercion in War*, he first breaks down strategic bombing into four strategies: punishment, risk, decapitation, and denial.¹⁶ Essentially, punishment is a threat to the civilian population through decisive strikes at them or their support mechanisms; risk is punishment in small or isolated steps that demonstrate the attacker's ability to continue if the victim does not give in. Decapitation is separating either the leadership from the government, or the leadership from the military—in either case attempting to cut off the victim's ability to continue resisting. Denial is destroying the victim's military forces and control of territory faster than they can recover.

After reviewing and evaluating thirty-three of the major and minor strategic bombing campaigns, Pape derived the following conclusions about the strategies (the methods of strategic bombing doctrine):

1. Punishment does not work...Modern states have extremely high pain thresholds when important interests are at stake

2. Risk does not work...Risk strategies are merely a weaker form of punishment...their credibility is often low because they have usually been employed by governments that were domestically constrained from releasing full-scale punishment.
3. Decapitation does not work...Political decapitation is not feasible because individual leaders are hard to kill, governments...harder to overthrow...Military decapitation is ineffective because air power cannot isolate national leaders from control...for long, and short disruptions do not matter.
4. Denial can work, but strategic bombing is not the best way to achieve it...no strategic bombing campaign has ever yielded decisive results...¹⁷

Thus Pape finds fault with the feasibility of at least three strategic bombing strategies—he questions the method. If that were not enough, he has this to say about strategic bombing doctrine's legitimacy:

The lesson of air power history is that strategic bombing is a very marginal coercive tool. In principle it could help shorten a coercive campaign, but it never has. Strategic bombing cannot substitute for ground and theater air pressure, but the combination of theater air power and land power can deny the opponent the capacity to control disputed territory, whether or not strategic bombing is also used.¹⁸

Mark Clodfelter, in his analysis of the American bombing of North Vietnam, comes at the weaknesses of strategic bombing doctrine from a different direction. He acknowledges that strategic bombing permeated the air war, and doctrine was described at the time as "...'destroying a selected series of vital targets' [that] will result in the loss of an enemy's war making capacity or will to fight. Vital targets include...'concentrations of uncommitted elements of enemy armed forces, strategic weapons systems, command centers, communications facilities, manufacturing systems, sources of raw material, critical material stockpiles, power systems, transportation systems, and key agricultural areas.'"¹⁹ Clodfelter points out that the vital centers outlined were composed of six industrial targets, three military, and one agricultural.

This vision of strategic bombing, and the experience of Vietnam's several campaigns, leads to two major problems with the doctrine. First, there were political limitations in the modern world that would interfere with target selection and execution; "...Johnson and his advisers could not help but take a cautious approach to escalation in Vietnam...[and] never defined a clear military objective for air power."²⁰ Second, the enemy did not conform to an industrial society nor to modern warfare, thus limiting the number of targets available and bringing into question their very 'vitality'; "...airpower is unlikely to provide either 'cheapness' or 'victory' in a guerrilla war."²¹ Clodfelter's thesis, then, is that although strategic bombing doctrine may have worked in World War II, it did not in Vietnam: either the doctrine was faulty as a method of warfare, or it needed to be revised and refined to describe the warfare for which it was valid. In either case, its legitimacy was in question.

Another critic also wrote with Vietnam as the context. Earl Tilford, Jr. approaches strategic bombing doctrine in a manner very similar to Clodfelter—in fact, he cites him in his own work—touching particularly on the problems a "...preindustrial, agricultural nation..." presented to a doctrine used "...to defeat industrialized nations like Nazi Germany and Imperial Japan."²² Ultimately, he traces the defeat in Vietnam to air leaders that were "not capable of integrating the social, cultural and political aspects of the conflict with its military aspects,"²³ and alleges that there was an overt reliance on strategic bombing doctrine at the expense of tactical air operations. A doctrine of air power must be more than strategic bombing, because by itself strategic bombing fails—it is an illegitimate basis for air power.

A staunch proponent of air power takes a similar view—that air power is much broader than strategic bombing—when examining the Gulf War. Col. Edward Mann feels that the Gulf War air campaign “validated Air Force doctrine on almost every point”:

From the opening moment, CENTAF forces struck fast, hard and relentlessly to induce shock and strategic paralysis. Early concentration on offensive counterair operations, SEAD and leadership targeting decided the outcome of the aerospace battle within minutes, assuring the success of land and naval operations. Aerospace forces maneuvered to mass firepower at decisive points...[and] provided movement, resupply, and support of deployed aerospace and surface forces...[T]hey also engaged the enemy both unilaterally and in coordination with other component forces.²⁴

Mann attributes a great portion of this success to something he calls the “airpower compromise”—a melding of air campaign plans based on strategic bombing, air superiority, battlefield preparation and support of the ground assault—just as he describes air power doctrine as more than strategic bombing. His perspective is that strategic bombing is insufficient as doctrine, in and of itself—it would not succeed on its own. “[T]he truth is, none of airpower’s capabilities is most important. The *combination* of all three-dimensional capabilities puts the power in aerospace power.”²⁵

In our doctrinal framework, then, environmental doctrine and its critiques are shown in Figure 4.

Environmental Doctrine	(1) Tactical Air Power	(2) Strategic Bombing	Critiques
Method	Air power aids the ground forces "...to gain decisive success"	Air Power adds indirect attack that can achieve national objectives independently	(1) Only justifies independent control, not independent service (2) Undemonstrated; applies only to industrial/modern & total war
Legitimacy	Air Corps & TAC AirLand Battle Gulf War	WW II/Gulf War SAC Global Reach/Power	(2) No wars won by strategic bombing (2) Only denial has any results (2) Politics limits applicability (1&2) Only multi-faceted air strategies using all air & space capabilities works
Teaching	TAC Manuals Other service & joint doctrine	Air Corps Tactical School (ACTS) USAF Doctrine through 1984 Air Campaigns	(2) Absence of intellectual development (2) Used only to justify small, relatively inexpensive forces (2) Morality questionable

Figure 4. Environmental Doctrine Matrix

The Flexibility of Airpower

Air Force doctrine should provide an integrating framework to tie together the various elements of the Air Force team, to show how these elements work together, and to provide a basis for integrating airpower with other forms of combat power in joint operations.

—Gen. Ronald R Fogleman

A summary of the analysis of aerospace fundamental and environmental doctrine is shown in Figure 5 below. In keeping with the original object, the next step is to evaluate these critiques for commonality or recurring observations. Repeated themes are likely candidates for exposing fundamental flaws in aerospace doctrine.

Aerospace Doctrine Critiques	Method	Legitimacy	Teaching
Fundamental “Engage and defeat enemy forces as a means of attaining national objectives”	—Aerospace power changed the context of war —Air power changed the nature of war —Air Power’s speed, range, flexibility extend war beyond battlefield	Military Operations Other Than War (MOOTW) experience contradicts	—Defined primary use of military not same as most common use —New Roles (e.g., Peacekeeping, Information Warfare) do not fit with doctrine
Environmental “Aid the ground forces” OR “Indirectly attack to achieve objectives independently”	—Support to battle only justifies centralized control, not independent service —Strategic bombing unproved except for denial of enemy forces	—No wars won by strategic bombing —Only denial has results —Politics limits bombing for influence —Only integrated use of airpower seems to work	—Absence of intellectual development —Doctrine used for budget battles —Morality of strategic bombing questionable

Figure 5. Aerospace Doctrine Matrix

The first recurring theme was examined with fundamental doctrine. The second theme appearing through Figure 5 is criticism of strategic bombing. Strategic bombing is cited as an aerospace method that offers war-winning results independently; yet, both the method and its legitimacy are questioned. If the only effective results gained by strategic bombing have been ‘denial’—the destruction of enemy military forces, not civilian targets—then it is not intrinsically different than other warfare, it is just another means of engaging the enemy. Additionally, there remains no historical support for strategic bombing gaining objectives independently, but much that suggests that air power is increasingly looked at as the *primary* or first means of destroying enemy forces. The implications of this common thread are that: a) environmental doctrine is insufficient—air power is neither a subordinate enabler of other mediums nor an independent war fighting

means; and b) fundamental doctrine remains true as far as the impact of strategic bombing is concerned—the essential nature of war would still be the destruction of enemy forces.

The third theme we can find is nearly a subordinate theme—the lack of a unifying view of aerospace or air power. This can be largely attributed to both our insecurity about strategic bombing doctrine (thus, the AF turns to an inarguable and agreeable means such as air superiority) and the fractures caused by an incomplete fundamental doctrine (thus, the AF ‘stovepipes’ into functional branches which are used by the nation but which lack a coherent linkage.) Along similar lines we find critiques of environmental doctrine which argue that *integrated use of all aerospace functions defines air power*; but this is meaningless as doctrine unless we more fully define the integration method.²⁶

The summary evaluation of the different levels of doctrine and current critiques results in three underlying flaws:

1. **Either the nature of warfare has changed, or the nation is using military force in inapplicable roles.** Our doctrinal heritage is that use of military force constitutes warfare, and operations other than war now outnumber war operations. Yet US doctrine appears to abandon non-war roles or arbitrarily relegate them as ad hoc, lower priority tasks.
2. **Strategic bombing and close air support are flawed as independent methods of warfare.** Strategic bombing has not independently attained objectives, and its successful use in history, in concert with other forces, is attributed to *denial* bombing—the destruction of enemy forces, not civilian targets or supporting mechanisms. Close air support with interdiction is described as an enabler of ground forces, yet increasingly ground forces are enabling completion of air strategies.
3. **There is no teaching that unifies aerospace power.** Aerospace power is a collection of air and space functions with no coherent doctrinal linkage between them. Distinguishing between, prioritizing, or projecting the value of aerospace functions is more a matter of opinion than legitimate doctrine.

The current Air Force Chief of Staff’s direction for a recent doctrine symposium centered on *integrating* elements of the Air Force into a coherent framework. Certainly

each of the flaws found in our survey of doctrine and critiques would support the importance of finding such a framework. More importantly,

“...If there is no logic ‘audit trail’ from fundamental concepts to current application, how does one judge the validity of organizational doctrine? It would appear that organizational doctrine without a firm foundation runs the risk of becoming little more than dogma.”²⁷

The lack of a unifying doctrine (the third flaw) is precisely what the CSAF is trying to overcome; we can even argue that current doctrine is the very dogma described by Drew. (See Appendix A for an analysis of organizational doctrine.) The ineffectiveness of strategic bombing or close air support to explain aerospace power and its use (the second flaw) is a potential starting point; it is also directly dependent on our solution to the flaw in fundamental doctrine and affects how we think about the aerospace medium.

The Gulf War and the US-led NATO air strikes in Bosnia seem to provide two successive instances where air power played decisive roles in the exercise of military power:

If the claims of air power advocates are correct, the United States has acquired a military edge over conventional opponents comparable to that exercised in 1898 by the soldiers of Lord Kitchener against the sword-wielding dervishes of the Sudan. The way would lie open to a reorientation of the defense budget toward an air-dominated force structure.²⁸

The quote above is rather mild compared to some who suggest massive realignments because “...air power is increasingly seen as a way to flex US military muscle without risking the lives of American ground troops.”²⁹ Unfortunately—at least for the Air Force—negotiating the programming and budget battles depends upon being able to discuss, explain and write about aerospace power’s methods, and needs derived from

those methods. In other words, air and space doctrine—our legitimized method(s)—needs to have a solid basis and shared understanding with military and civilian leadership.

A shared understanding with military and civilian leadership of what constitutes air and space power is directly dependent on accepting the changed nature of war, and therefore a changed fundamental doctrine. Air power's flexibility has no coherent expression within today's Napoleonic paradigm of warfare. For example, air power's flexibility extends a nation's options across the spectrum of military activities; but if the focus is on war, we have seen aerospace power's proven abilities lie mostly in force destruction and enabling of ground combat. Thus, aerospace power finds it difficult to distinguish itself as a truly different, and sometimes independent, military means. Even if strategic bombing or strike never proves itself to be independently war winning, the focus on winning wars is itself inappropriate—witness the strikes in Bosnia and airlifts to Somalia and Rwanda.

In the same vein, high-technology space capabilities struggle to find a place in the Napoleonic force destruction paradigm, when their utility to the nation seems obvious. Similarly, the AF has built and exercised nuclear weapons, global airlift, missiles, global command and control, precision-guided munitions, and stealth weapons. Yet as long as most of these are in non-war situations, the AF is unable to unify the functions in a vision or doctrine of what aerospace offers the nation. Why else would even the Air Force abandon deterrence of weapons of mass destruction as a core competency after 50 years of building and employing its capabilities?

The Tasks of Modern Warfare	Representative Examples	Air and Space Power Examples
Compel	Large Scale Combat Operations Attack/Defend	Air & Space Superiority CAS/Interdiction Strategic Denial
Coerce	Blockade/Show of Force Raid/Strike Peace Enforcement Counterterrorism	Air Raid/Strike Air Expeditionary Force Strategic Airlift to Allies C2/Information Warfare (?)
Deter	Peacekeeping Freedom of Navigation Protection of Shipping	Nuclear Deterrence Space Operations/WMD Monitoring C4ISR/Information Dominance (?)
Reassure	NEO/Nation Assistance Counterinsurgency Humanitarian Assistance US Civil Support	Civil/Humanitarian Airlift Global Mobility/Air Refueling Civil Weather & Navigation Aids Acquisition/Military Education
Proposed	Joint Pub 3-07, MOOTW	Proposed Alignment

Figure 6. The Tasks of Modern Warfare

Figure 6 shows the utility of taking a the new view of military purposes proposed in Chapter III and revising air and space doctrine to encompass flexibility.

As we compare what joint doctrine currently calls “MOOTW” to what the Air Force does and offers, it should not be surprising to find that the majority of aerospace functions lie in the non-war realm. Small wonder that we find it so difficult to define the value of airpower in relation to the other services—to formulate a solid doctrine; as long as we remain with our current fundamental doctrine, air and space contributions will largely remain in a second-class grab bag called “operations other than war.”

Air and space power offer unparalleled capabilities for the nation to compel adversaries with air and space superiority and global attack, to coerce with precision engagement, to deter with information superiority and WMD threat, and

reassure with rapid global mobility and agile combat support. Only one of these 'core competencies' is not contained in the current AF vision—WMD threat.³⁰

Notes

¹ Evaluation Staff of Air War College (ESAWC), *Service Roles and Missions in the Future* (Air University Library, AU #M-37097, May 1958), 6.

² Murray, 95; and Builder, Chapters 14 and 15.

³ ESAWC, 9.

⁴ Col. Mann makes a similar observation in a footnote in *Thunder and Lightning*, 179.

⁵ Giulio Douhet argues often that air resources within the naval or ground armies are 'useless, superfluous, and harmful.' *The Command of the Air* (Office of Air Force History, Washington DC, 1983 reprint of the 1942 edition), 215.

⁶ Alfred F. Hurley, as quoted by Dr. Mowbray, 23.

⁷ H.H. Arnold, as quoted by Maj. Barbara Faulkenberry in *Global Reach—Global Power: Air Force Strategic Vision, Past and Future* (Air University Press, Maxwell AFB, Feb 1996), 14.

⁸ Quotation of findings by Menoher Board of 1919 by Robert F. Futrell, *Ideas, Concepts, Doctrine* (Air University Press, Maxwell AFB, AL, 1971), 30.

⁹ Stephen Budiansky, "Rules of Engagement," *US News & World Report* v114 n3 (Jan 25, 1993), 53.

¹⁰ David Callahan, "Air Power comes of age," *Technology Review* v97 n6 (Aug-Sept 1994), 67.

¹¹ Ibid., 70.

¹² Col. Phillip Meilinger, *10 Propositions Regarding Air Power* (Air Force History and Museums Program, 1995), 10-11.

¹³ Billy Mitchell, as quoted by Futrell, 33-34.

¹⁴ B.H. Liddell Hart, *Paris, or the Future of War* (E.B. Dutton & Co., New York, 1925), 36-37.

¹⁵ John Warden, "Air Theory for the Twenty-first Century," *Challenge and Response* (Air University Press, Maxwell AFB, AL, August 1994), 326.

¹⁶ Pape, Chapter 3.

¹⁷ Pape, 316.

¹⁸ Pape, 318.

¹⁹ Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam* (The Free Press, New York, 1989), 209.

²⁰ Clodfelter, 209.

²¹ Clodfelter, 210.

²² Earl H. Tilford, Jr., *Setup: What the Air Force Did in Vietnam and Why* (Air University Press, Maxwell AFB, AL, June 1991), 285.

²³ Tilford, 288.

²⁴ Edward C. Mann III, *Thunder and Lightning: Desert Storm and the Airpower Debates* (Air University Press, Maxwell AFB, AL, April 1995), 175.

²⁵ Mann, 180.

Notes

²⁶ This is like saying, "My toolbox defines me as a mechanic." Yet the toolbox tells us nothing about how I fix things, what I am best at fixing, and what tools I need more than others.

²⁷ Drew, 48.

²⁸ Eliot Cohen, "The Mystique of US Air Power," *Foreign Affairs* v73 n1 (Jan-Feb 1994), 111.

²⁹ Callahan, 64.

³⁰ Global Engagement: A Vision for the 21st Century Air Force (Washington DC: Department of the Air Force, Dec 1996), 9.

Chapter 5

Visions, visions everywhere...

Global Engagement: A Vision for the 21st Century Air Force is based on a new understanding of what air and space power mean to the nation - the ability to hit an adversary's strategic centers of gravity directly as well as prevail at the operational and tactical levels of warfare. Global situational awareness, the ability to orchestrate military operations throughout a theater of operations and the ability to bring intense firepower to bear over global distances within hours to days, by its very existence, gives national leaders unprecedented leverage, and therefore advantages.

—Global Engagement

Shortly after the Air Force published its first strategic vision—*Global Reach, Global Power*—in 1990, and in concert with the Quality management revolution, military organizations began defining their own visions for the future in written documents, to be shared within and without the institutions concerned. One writer reviewing the evolution of *Global Reach*—*Global Power* defined a strategic vision as “...a formal, written product endorsed by the organization’s senior leader that provides broad guidance for the organization in the present while providing sage direction for the future. It encapsulates the organization’s mission and purpose, yet is not so detailed as to discuss doctrine.” Doctrine differs from visions in two important respects: visions can be much more general in describing how something is accomplished; and legitimacy is conferred merely by senior endorsement.

If we are to secure a course for air and space power doctrine and recommend the first steps in defining its importance, we must establish some linkages or correlation between our national military purposes and fundamental doctrine. Currently, there are three important vision documents that relate to aerospace power: the National Security Strategy of Engagement and Enlargement, *Joint Vision 2010*, and the most recent, *Global Engagement*. The intent of this final section is to define the common threads between these visions and fundamental military purposes, and formulate a recommendation for aerospace power doctrine.

Strategic Purposes

The February 1996 National Security Strategy (NSS) lays out the primary objectives that depend upon the political, military and economic instruments of our nation as: enhancing our security; promoting prosperity at home; and promoting democracy.¹ The military has roles to play in the attainment of each of these objectives, and the NSS has three areas where the purposes of military force are described from differing perspectives. Figure 7 shows the ties between recent history, planning for defense capabilities, and the nation's intent in the employment of military forces.

The Tasks of Modern Warfare	Recent Events (p. ii, iii)	Defense Capabilities (p. 13)	US Military Employment (p. 18)
Compel		Defeating aggression in MRCs	Vital Interests—include use of unilateral force
Coerce	Freedom for Haiti Enforcing UN mandates in Bosnia	Contributing to multilateral Peace Operations	Important Interests—selective & limited force
Deter	Iraqi threats/Kuwait Stopped spread of conflict to FYROM	Detering Aggression Countering WMD Providing Credible Overseas Presence	(Maintain robust nuclear forces for deterrence—p. 19)
Reassure	Saved lives in Rwanda	Supporting Counterterrorism Fighting Drug Trafficking	Humanitarian Interests—Using unique capabilities for relief
proposed	National Security	Strategy of Engagement	and Enlargement, 1996

Figure 7. New Purposes and the National Security Strategy

The use of military force clearly extends beyond large scale combat that we normally call war; in fact, recent events do not include “compel” operations but do cover each of the other purposes. Additionally, although the NSS does not use our proposed purposes of war, the defense capabilities planned for the future and the US intent to employ armed forces correlate quite well to them. The NSS clearly recognizes the use of military forces beyond combat roles. At one point, it says:

We therefore will send American troops abroad only when our interests and our values are sufficiently at stake...When we do so, it will be with clear objectives to which we are firmly committed and which—*when combat is likely*—we have the means to achieve decisively...These requirements are as pertinent for humanitarian and other nontraditional interventions today as they were for previous generations during prolonged world wars.² [italics added]

It would be superfluous to add “when combat is likely” if the primary purpose of our armed forces was combat—otherwise, the exceptional case would be “when combat is *unlikely*.”

In contrast, *Joint Vision 2010* is surprisingly combat centered, though it does not appear that way at first glance. The introduction states a broad purpose for both the vision and US military forces:

Joint Vision 2010 is the conceptual template for how America’s Armed Forces will channel the vitality and innovation of our people and leverage technological opportunities to achieve new levels of effectiveness in joint warfighting.. Focused on achieving dominance across the range of military operations through the application of new operational concepts, this template provides a common direction for our Services in developing their unique capabilities within a joint framework of doctrine and programs as they prepare to meet an uncertain and challenging future.³

This description would seem to support a broader definition of fundamental doctrine such as we are suggesting. However, the vision later states:

Our forces have been largely organized, trained and equipped to defeat military forces of our potential adversaries. Direct combat against an enemy’s armed forces is the most demanding and complex set of requirements we have faced. Other operations, from humanitarian assistance in peacetime through peace operations in a near hostile environment, have proved to be possible using forces optimized for wartime effectiveness.⁴

This lukewarm statement—that a war-centered military has proved it possible to do ‘other operations’—serves as a basis for launching into a description of four operational concepts for the future military: dominant maneuver; precision engagement; full dimensional protection; and focused logistics. Each of these is defined in combat engagement or ‘war’ terms, with little to no reference to MOOTW utility.⁵

The Air Force vision, *Global Engagement*, is somewhat broader in its approach. Core competencies are its equivalent to Joint Vision’s operational concepts, and are

defined as “the combination of professional knowledge, airpower expertise, and technological know-how that, when applied, produces superior military capabilities.”⁶

These core competencies will be developed as the Air Force’s contribution to the joint team:

The first quarter of the 21st Century will demand that the Joint Force Commander field robust, flexible capabilities to cope with a wide range of contingencies. Each military service must present to the combatant commander a set of relevant and complementary capabilities. This presentation allows the Joint Force Commander to consider all options available, and to tailor campaign plans to best meet the military objectives of the mission.⁷

The Air Force vision seems to recognize that aerospace capabilities and contributions are better explained with a wider view of military purpose; even the description above rigorously avoids tying “contingencies,” “military objectives” and “mission” to combat engagements with an enemy.

Figure 8 shows how *Joint Vision 2010* and *Global Engagement* correlate with our new military purposes, or modern nature of warfare. It is important to point out that, while we can realign some joint concepts with their closest military purpose, *Joint Vision 2010* defines them more strictly in war fighting, or “compel,” terms.

The Tasks of Modern Warfare	Joint Vision 2010 Full Spectrum Dominance	Global Engagement
Compel	Dominant Maneuver Full Dimensional Protection	Air and Space Superiority Global Attack
Coerce	Precision Engagement	Precision Engagement
Deter		Information Superiority
Reassure	Focused Logistics	Rapid Global Mobility Agile Combat Support
proposed	proposed alignments	

Figure 8. New Purposes and Core Competencies

The Direction for Doctrine

The beginning assumption of this traverse over air and aerospace doctrine was that there might be, somewhere in the field of air power doctrine and its criticisms, a fundamental flaw for us to focus on. This fundamental flaw would have such pervasive effects, that attempts to correct or argue doctrinal approaches without addressing the flaw would be doomed to failure. And it seems that within the three basic flaws in aerospace doctrine revealed here that there is at least one fundamental problem: how the US military views its own military purposes and the essential nature of war.

As this research has shown, whether air power caused a change in the essential nature of war is irrelevant—there is enough evidence to show that our current concept of the warfare as “engaging and defeating enemy forces” is self-limiting and out of step with experience. In an attempt to acknowledge the many uses of military force beyond war

fighting but remain with the Napoleonic paradigm, our military arbitrarily established categories of 'war' and 'not-war' or MOOTW and distributed them throughout doctrinal and strategic thought. The results are particularly harsh on those military forces which offer more options in the MOOTW arena.

Yet the way out of this quagmire is present. A different integration of war and military operations other than war tasks can be that "Military forces provide a nation's ability to: **compel** adversaries by defeating or destroying their forces; **coerce** them with selective applications of force against critical targets; **deter** them with credible threats of punishment and dominant knowledge of their capabilities and intent; and **reassure** and sustain allies by deploying forces, resources, and services to meet critical needs." This view of warfare is shown in this research to be consistent with joint doctrine, the national security strategy, and joint and Air Force strategic visions.

Aerospace power proponents have long touted the *flexibility* that air forces offer the nation. If, as *Global Engagement* asserts, "core competencies provide a bridge between doctrine and the acquisition and programming process,"⁸ then now is the time to rebuild an aerospace power doctrine that is not founded on strategic bombing, nor air superiority or deterrence, but on the inherent range of options afforded by air and space forces to compel, coerce, deter and reassure in the interests of our nation's security. If we do not take this opportunity, we in the air forces may forfeit the value of our own vision and our contributions to the joint team.

Air and space power offer unparalleled capabilities for the nation to compel adversaries with air and space superiority and global attack, to coerce with

**precision engagement, to deter with information superiority and WMD threat, and
reassure with rapid global mobility and agile combat support.**

Notes

¹ National Security Strategy of Engagement and Enlargement (White House, February 1996), 11-12.

² NSS, iii.

³ JV 2010, 1.

⁴ Ibid., 11.

⁵ Ibid., 13-18.

⁶ Global Engagement, 9.

⁷ Ibid.

⁸ Global Engagement, 9.

Appendix A

Organizational Critiques

Aerospace forces perform four basic roles: aerospace control, force application, force enhancement, and force support. Roles define the broad purposes or functions of aerospace forces.

—AFM 1-1, March 1992

This statement captures the heart of currently published AF organizational doctrine: that air forces are used to control the aerospace environment (aerospace control), allowing freedom to attack targets and support land and sea actions (force application). Those actions which increase efficiency and prolong operations for these two roles fulfill force enhancement and force support roles. This doctrine goes on to state that “Aerospace control normally should be the first priority of aerospace forces...[and] any reduction in control threatens every mission, campaign, and type of force.”¹

The same paragraph of aerospace control doctrine also notes that “Control is an enabling means rather than an end in itself,” demonstrating that there is some thought to the purpose of controlling air and space. But “the first priority” connotes a large commitment by the organization to ascendance of this military role. In fact, the end purpose for these means—its connection to either environmental or fundamental military doctrine—is somewhat vague. General William W. Momyer, a former Commander of Tactical Air Command, was quoted in a classic text on Air Superiority as saying:

The contest for air superiority is the most important contest of all, for no other operations can be sustained if this battle is lost. To win it, we must have the best equipment, the best tactics, the freedom to use them, and the best pilots.²

In its introduction, the same text carries this thought forward by stating that:

Tactical airpower leaders in the United States today define their mission as sixfold: counterair (defensive and offensive), air support of ground operations, interdiction, special operations, 'support' to include reconnaissance and electronic combat, and theater nuclear warfare. Obviously, nearly all are extremely difficult to carry out without air superiority.³

Similarly, the 1992 manual does not tout *aerospace control* as merely the enabling step to exercising *force application* (the Air Force's second combat role) to achieve either military or national objectives; rather, it more broadly (and vaguely) says, "While powerful synergies can be created when aerospace, land and naval forces are employed in a single, integrated campaign, it is possible that aerospace forces can make the most effective contribution when they are employed in parallel or relatively independent aerospace campaigns."⁴ In other words, current doctrine cites the achievement of air superiority as the Air Force's central method in the use of air power to attain military objectives. This less-than-rousing endorsement of force application (composed of strategic attack, interdiction and close air support) is where many critics begin.

Carl Builder describes classical air power as proposing "...that military aviation had opened up a completely new and dominant dimension of warfare...which could produce quick and decisive results in war if exploited through offensive strikes directly at the critical sources of enemy power; but to do those things, military aviation must first be used to control the air and be centrally and independently controlled."⁵ But the modern AF now was 'stovepiping', pursuing individual means such as missiles, bombers, and fighters,

with no unifying concept of what the means were intended to accomplish. Air power doctrine had devolved into "...deterrence theory, [the Army's] AirLand battle doctrine, and the dictum of air supremacy."⁶ The essence of this argument against the current air power doctrine is twofold: first, the Air Force has abandoned its direct connection to fundamental doctrine—air power achieves national objectives by striking decisively against the enemy; second, in its place the organization has a collection of means, of which aerospace control (air and space superiority) is prime.

Builder is not the only critic of a fractionated, air superiority-centered organizational doctrine. In his book *Bombing to Win*, Robert Pape notes that "...of the three main air combat missions—air superiority, tactical bombing, and strategic bombing—strategic bombing [supports institutional independence and autonomy] best because it is an inherently independent mission, requiring little coordination with other services."⁷ Ultimately Pape is not arguing for a strategic bombing doctrine; he does emphasize, though, that:

Air superiority enhances air force autonomy, but only to the extent that it is associated with strategic bombing, which requires control of air space over enemy territory. Absent strategic bombing, air superiority could in principle be limited to control of air space over fielded forces and homeland territory. Thus truncated, air superiority would not unambiguously justify an independent air service.⁸

From Pape's viewpoint, then, air superiority serves as a weak centerpiece for *organizational* doctrine, for its ends are not clearly separable from the ends of other services.

Though it may seem out of place, this paranoia that the Air Force's central doctrine will not justify its existence is a common theme. Dr. James Mowbray cites it as a

“...difficulty that has been to a great extent an influence on the Air Force abandoning its reliance upon airpower theory as its underlying creed. Specifically, it has become obsessed with winning the budget battles for hardware without the underpinning of airpower theory.”⁹ At the organizational level of doctrine, the problem is whether a chosen method can carry bureaucratic power in winning budgetary support for the service while simultaneously explaining the organization’s military purpose and means for attaining national objectives. As we will see in the next section, air superiority or aerospace control may have minimized service budget fratricide, but it did not unify air power practitioners.

In our doctrinal framework, then, organizational doctrine and its critiques are shown in Figure 9.

Organizational Doctrine	AFM 1-1	Critiques
Method	Air Force achieves aerospace control and provides force application	Aerospace control is only a means Abandons connection to fundamental purposes
Legitimacy	Air Corps/Service SAC/TAC ACC	Fractionates AF into ‘stovepipes’ Subordinates strategic functions to tactical Serves budget battles more than mission
Teaching	USAF Roles USAF Training Doctrine publications	Doctrine does not communicate to AF people a unifying purpose

Figure 9. Organizational Doctrine Matrix

Notes

¹ AFM 1-1, para. 3-4, 10.

² Benjamin F. Cooling, editor, *Case Studies in the Achievement of Air Superiority* (Center for Air Force history, Washington DC, 1994), foreword.

Notes

³ Ibid., xvii.

⁴ AFM 1-1, 9.

⁵ Carl H. Builder, *The Icarus Syndrome* (Transaction Publishers, New Brunswick NJ, 1994), 62.

⁶ Ibid., 180.

⁷ Robert A. Pape, *Bombing to Win: Air Power and Coercion in War* (Cornell University Press, Ithaca NY, 1996), 327.

⁸ Ibid., 327.

⁹ Dr. James A. Mowbray, "Air Force Doctrine Problems: 1926-Present," *Airpower Journal* (Winter 1995), 22.

Bibliography

Books

- Builder, Carl H. *The Icarus Syndrome*. New Brunswick NJ: Transaction Publishers, 1994.
- Cooling, Benjamin F., editor. *Case Studies in the Achievement of Air Superiority*. Washington DC: Center for Air Force History, 1994.
- Clausewitz, Carl von. *On War*. Edited and translated by Michael Howard and Peter Paret. Princeton translation, Princeton NJ: Princeton University Press, 1989.
- Clodfelter, Mark. *The Limits of Air Power: The American Bombing of North Vietnam*. New York: The Free Press, 1989.
- Douhet, Giulio. *The Command of the Air*. Washington DC: Office of Air Force History, 1983 reprint of the 1942 edition.
- Futrell, Robert F. *Ideas, Concepts, Doctrine*. Maxwell AFB: Air University Press, 1971.
- Hastings, Max. *The Korean War*. New York: Touchstone Press, 1987.
- Holley, I.B. *Ideas and Weapons*. Reprint by Office of Air Force History, Washington, DC: US Government Printing Office, 1983.
- Liddell Hart, B.H. *Paris, or the Future of War*. New York: E.B. Dutton & Co., 1925.
- Mann, Edward C. III. *Thunder and Lightning: Desert Storm and the Airpower Debates*. Maxwell AFB: Air University Press, April 1995.
- Meilinger, Phillip. *10 Propositions Regarding Air Power*. Washington, DC: Air Force History and Museums Program, 1995.
- Pape, Robert A. *Bombing to Win: Air Power and Coercion in War*. Ithaca NY: Cornell University Press, 1996.
- Tilford, Earl H. Jr. *Setup: What the Air Force Did in Vietnam and Why*. Maxwell AFB: Air University Press, June 1991.
- Warden, John. *The Air Campaign: Planning for Combat*. New York: Pergamon-Brassey, 1989.
- Watts, Barry D. *The Foundations of U.S. Air Doctrine*. Maxwell AFB: Air University Press, December 1984.

Articles

- Budiansky, Stephen. "Rules of Engagement," *US News & World Report* v114 n3, January 25, 1993.
- Callahan, David. "Air Power Comes of Age," *Technology Review* v97 n6, Aug-Sept 1994.
- Cohen, Eliot S. "The Mystique of US Air Power," *Foreign Affairs* v73 n1, Jan-Feb 1994.

- Drew, Dennis M. "Of Trees and Leaves: A New View of Doctrine," *Air University Review* 33, January 1982.
- Fogleman, Ronald. "Aerospace Doctrine: More than Just a Theory," *Airpower Journal*, Summer 1996.
- . "Air Force: The Future is Ours...Today," *Foundation Forum*. Arlington, VA: Aerospace Education Foundation, October 1995.
- Grant, Rebecca. "Closing the Doctrine Gap," *Air Force Magazine* v80 n1, Arlington, VA: Air Force Association, January 1997.
- Holley, I.B. "The Doctrinal Process," *Military Review* 59, April 1979.
- Huntington, Samuel P. "National Policy and the Transoceanic Navy," *US Naval Institute Proceedings* 80, no. 5, May 1954.
- Kitfield, James. "Waging Peace," *National Journal*, 5 October 1996.
- Luttwak, Edward N. "Toward Post-Heroic Warfare," *Foreign Affairs* v74 n3, May-June 1995.
- Mowbray, Dr. James A. "Air Force Doctrine Problems: 1926-Present," *Airpower Journal*, Winter 1995.
- Shy, John. "Jomini," *Makers of Modern Strategy*. Princeton, NJ: Princeton University Press, 1986.
- Szafranski, Richard and Martin C. Libicki. "...Or Go Down in Flame?: Toward an Airpower Manifesto for the Twenty-first Century," *Airpower Journal*, Fall 1996.
- Warden, John. "Air Theory for the Twenty-first Century," *Challenge and Response*. Maxwell AFB: Air University Press, August 1994.

Papers and Publications

- Air Force Manual 1-1, Volume 1, *Basic Aerospace Doctrine of the United States Air Force*. Washington, DC, March 1992.
- Evaluation Staff of Air War College (ESAWC). *Service Roles and Missions in the Future*. AU #M-37097, Maxwell AFB: Air University Library, May 1958.
- Faulkenberry, Barbara. *Global Reach—Global Power: Air Force Strategic Vision, Past and Future*, Maxwell AFB: Air University Press, February 1996.
- Field Manual (FM) 100-3, *Strategic Purposes of Army Forces* (draft). Washington DC: HQDA, April 1995.
- Field Manual (FM) 100-5, *Operations*. Washington DC: HQ TRADOC, June 1993.
- Joint Chiefs of Staff, *Joint Vision 2010*. Washington DC, 1995(?).
- Joint Pub 1, *Joint Warfare of the US Armed Forces*. Washington, DC, 1995.
- Joint Pub 3-07, *Joint Doctrine for Military Operations Other Than War*. Washington DC: Joint Chiefs of Staff, June 1995.
- United States Air Force. *Global Engagement: A Vision for the 21st Century Air Force*. Washington DC: Department of the Air Force, December 1996.
- White House. *A National Security Strategy of Engagement and Enlargement*. Washington DC: White House, February 1996.

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